MAYER BROWN LLP
John Nadolenco (SBN 181128)
350 South Grand Avenue
25th Floor
Los Angeles, CA 90071-1503
Telephone: (213) 229-9500
jnadolenco@mayerbrown.com

Lauren R. Goldman (*pro hac vice*)
1221 Avenue of the Americas
New York, NY 10020
Telephone: (212) 506-2500
lrgoldman@mayerbrown.com

Counsel for Defendant Facebook, Inc.

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

IN RE FACEBOOK BIOMETRIC INFORMATION PRIVACY LITIGATION	**FACEBOOK, INC.'S MOTION TO EXCLUDE PORTIONS OF THE EXPERT REPORT, OPINIONS, AND TESTIMONY OF DR. ATIF HASHMI**
THIS DOCUMENT RELATES TO:	
ALL ACTIONS	Master Docket No.: 3:15-CV-03747-JD
	Date: May 17, 2018
FREDERICK WILLIAM GULLEN, on behalf of himself and all others similarly situated,	Time: 10:00 a.m. Location: Courtroom 11
Plaintiff,	Hon. James Donato
v.	*[Proposed Order and Declaration of John Nadolenco filed concurrently herewith]*
FACEBOOK, INC.,	
Defendant.	Case No. 3:16-cv-00937-JD

TABLE OF CONTENTS

1

TABLE OF AUTHORITIES

2

Cases

24

25

26

27

28

1

Other Authorities

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

iii

FACEBOOK'S MOTION TO EXCLUDE PORTIONS OF THE EXPERT REPORT, OPINIONS, AND
TESTIMONY OF DR. ATIF HASHMI;
CASE NO. 3:15-CV-03747-JD & CASE NO. 3:16-CV-00937-JD

NOTICE OF MOTION & MOTION

TO ALL PARTIES AND THEIR COUNSEL OF RECORD:

PLEASE TAKE NOTICE THAT, on May 17, 2018, at 10:00 a.m., or as soon thereafter as the matter can be heard, in Courtroom 11 of this Court, located at 450 Golden Gate Avenue, San Francisco, California, 94102, before the Honorable James Donato, defendant Facebook, Inc. ("Facebook") will and hereby does move the Court for an order granting this Motion to Exclude Portions of the Expert Report, Opinions, and Testimony of Dr. Atif Hashmi. This motion is made pursuant to Federal Rule of Civil Procedure 26 and Federal Rule of Evidence 702. Good cause exists to grant this motion:

1.   Dr. Hashmi's opinions that (a) Facebook's facial-recognition algorithms can generate face signatures for "virtually every face that is present in a photo uploaded to Facebook's system," which can then be used to identify those faces, including faces of non-users; and (b) Facebook's facial-recognition algorithms "extract, learn, and rely upon facial landmarks or features" to generate face signatures, are not the product of reliable methods.

2.   Dr. Hashmi is not qualified to offer the above opinions.

This motion is based on this Notice of Motion and Motion; the attached Memorandum of Points and Authorities; the accompanying Declaration of John Nadolenco; the pleadings and documents on file in this lawsuit; and any other arguments that may be raised at the hearing in this matter.

1

2

3

4

5

INTRODUCTION

Plaintiffs claim that Facebook violated the Illinois Biometric Information Privacy Act ("BIPA") by using facial-recognition technology to obtain their "scan[s] of face geometry" without providing adequate notice or obtaining their consent. To support their claims, plaintiffs have disclosed Dr. Atif Hashmi as a purported expert in source code. He plans to testify that:

6

7

8

9

10

11

12

13

The flaws in these opinions were laid bare at Dr. Hashmi's deposition. He *admitted*:

14

15

16

17

18

19

20

21

In other words, Dr. Hashmi admits that the code *contradicts* his first opinion and contains nothing that supports his second opinion; and he admits that he lacks the qualifications to opine about how facial-recognition technology works from a theoretical and scientific perspective. For two reasons, these concessions confirm that these opinions are inadmissible under Federal Rule of Evidence 702 and *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).

[1]   Dr. Hashmi also offered two additional opinions, which are not challenged in this motion.

FACEBOOK'S MOTION TO EXCLUDE PORTIONS OF THE EXPERT REPORT, OPINIONS, AND
TESTIMONY OF DR. ATIF HASHMI;
CASE NO. 3:15-CV-03747-JD & CASE NO. 3:16-CV-00937-JD

First, Dr. Hashmi's admissions demonstrate that these opinions are not "reliable" under *Daubert*. Dr. Hashmi was tasked with reviewing Facebook's source code to explain how the code implements Facebook's facial-recognition technology, but he admits that there is *nothing in the source code* that supports either opinion. He attempts instead to find support for his opinions in scientific principles of how facial-recognition algorithms work as a general matter, but he identifies no scientific research that supports them.

Second, even if there were a reliable basis in the scientific research for his opinions (which there is not), Dr. Hashmi would be unqualified to testify about it: as he admits, and as his background confirms, he is not an expert in facial-recognition systems.

BACKGROUND

A.   Facebook's Facial-Recognition Technology[2]

Facebook's Tag Suggestions feature simplifies the tagging of photos. When a person uploads a photo, Facebook will sometimes, but not always, employ facial-recognition technology to determine whether certain of the uploader's Facebook friends appear in the photo; if so, Facebook may prompt the uploader to tag those friends. To determine whether one of those friends appears in the photo, Facebook conducts four processes: detection, alignment, representation, and classification. Yadan Dep. (Ex. 3) at 84; Taigman Dep. (Ex. 4) at 128-29.

1. *Face detection*: ███████████████████████████████

██

██

██████████████████████████████

2. *Alignment*: ████████████████████████████████████

██

3. *Representation*: ███████████████████████████████

██

██

---

[2]   Facebook's technology is described in more detail in its contemporaneously filed motion for summary judgment.

1

2   [REDACTED] A neural network is a collection of computational units ("nodes") that

3   are combined to produce the ability to represent and recognize complex patterns, such as images

4   (of faces, animals, cars, etc.), voices, or music. *See, e.g.*, J. Schmidhuber, *Deep Learning in*

5   *Neural Networks: An Overview* 4 (2014) (Ex. 5). A DNN is a network with many layers of

6   typically millions of nodes that have millions of weights and connections. *Id.*

7   A DNN is not explicitly programmed with instructions on how to represent and recognize

8   patterns. Instead, the network is designed to learn for itself what "features" of the input data are

9   useful for accomplishing this task. *See* Christopher M. Bishop, PATTERN RECOGNITION AND

10 MACHINE LEARNING 1-3, 226 (2006) (Ex. 6). [REDACTED]

11 [REDACTED]

12 [REDACTED]

13 [REDACTED]

14   A DNN learns which features of input data are most important to solving a given problem

15 by attempting to solve the problem on one example from a set of training data; being told

16 whether it reached the correct solution; using that information to adjust the millions of weights

17 associated with its millions of nodes (the network's parameters); and then repeating the process

18 upwards of several million times. Bishop, *supra*, at 2-3, 232-42. Because of the complexity of

19 this process, the scientific community has not yet been able to explain exactly why and how

20 DNNs reach their decisions. *See, e.g.,* David Gunning, Explainable Artificial Intelligence (XAI),

21 Defense Advanced Research Projects Agency (Ex. 7); Aaron M. Bornstein, *Is Artificial*

22 *Intelligence Permanently Inscrutable?*, Nautilus, Sept. 1, 2016 (Ex. 8).

23   In the context of facial recognition, the input data to a DNN are the individual pixel

24 values[3] of a face image. [REDACTED]

25 [REDACTED]

26 _____

27 [3]   Each location in a digital image is a pixel. In a color photo, each pixel is expressed in
    terms of three numerical values: the R value (red value), the G value (the green value), and the B

28 value (the blue value).

3

1

2

3

4

5

6

7 **4.** *Classification*:

8

9

10

11

12

13

14

15

16 **B.   Plaintiffs' Expert Disclosure**

17

18

19

20

21

22

23

24

25

26

27 4

28

4

1 ██

2 ██

3 ███

4   In this case, Dr. Hashmi spent several weeks reviewing Facebook's source code. He then

5 submitted a report containing several opinions, the first two of which are relevant to this motion:

6 ████████████████████████████████████ ███████████████████

7 ██

8 ██

9 ██

10 ██

11 ████████

12   These opinions purport to be based on Dr. Hashmi's review of the source code. ████

13 ██

14 ██

15 ██

16 ██

17 ██

18 ██

19 ██

20 ██

21 ██

22 ██

23 ██

24 ██

25

26 [5] ██
                                                                        To avoid
27 confusion with the "classification" step of Facebook's system, Facebook refers to the collection

28 of algorithms as "facial recognition algorithms."

1 ██

2 ██

3 ██

4 ██

5 ██

6 ████████████████████████████

7   ██

8 ██

9 ██

10 ██

11 ██ Once again,

12 however, that opinion finds no support in the code: ██████████████████

13 ██

14 ████████████████

15   ██

16 ██

17 ████████████████████████████████████

18   **ARGUMENT**

19   Federal Rule of Evidence 702 provides that expert testimony is admissible only where (1)

20 the expert is qualified; (2) "the testimony is based on sufficient facts or data"; (3) "the testimony

21 is the product of reliable principles and methods"; and (4) "the expert has reliably applied the

22 principles and methods to the facts of the case." Dr. Hashmi's opinions described above fail to

23 satisfy these requirements.

24   Dr. Hashmi was retained to review the code and, based on his purported expertise in

25 reviewing code, provide opinions about what that code does. ████████████████████████████

26 ████████████████████████ revealed nothing to support the opinions he wanted to give.

27 Undeterred, Dr. Hashmi gave the opinions anyway, with no support in any scientifically valid

28 sources or methodologies. This is precisely the type of unreliable testimony that is inadmissible

6

under Rule 702. Moreover, Dr. Hashmi is not qualified to provide opinions about Facebook's facial-recognition technology that go beyond what the source code does, because he is not an expert in facial-recognition algorithms. Each of these reasons provides an independent basis for excluding Dr. Hashmi's first two opinions.

I.   DR. HASHMI'S FIRST TWO OPINIONS ARE UNSUPPORTED BY ANY RELIABLE ANALYSIS OR METHODOLOGY.

To be admitted under Rule 702, expert testimony must be "reliable"—*i.e.*, it must be "based on sufficient facts or data" and "the product of reliable principles and methods." Fed. R. Evid. 702; *see also Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579 (1993). The touchstone of reliability is scientific validity. *Daubert*, 509 U.S. at 590 n.9. The disclosing party can establish scientific validity by showing that the expert's conclusions are supported by principles and methods that display the "hallmarks of scientific rigor: peer-reviewed research, studies, or experiments." *United States v. Geanakos*, 2017 WL 4883294, at *3 (E.D. Cal. Oct. 30, 2017); *see also Domingo ex rel. Domingo v. T.K.*, 289 F.3d 600, 605-06 (9th Cir. 2002). At a minimum, an expert must *explain* how he reached his conclusions. *Claar v. Burlington N. R.R. Co.*, 29 F.3d 499, 502 (9th Cir. 1994). And where the sources upon which the expert purports to rely do not in fact support the expert's conclusions, the expert's conclusions cannot be said to be a product of reliable principles and methods. *See, e.g., Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 144-47 (1997); *Lopez v. Wyeth-Ayerst Labs., Inc.*, 139 F.3d 905, at *1-2 (9th Cir. 1998) (unpublished mem. op.).

Under these authorities, there are two methods that would have sufficed to render Dr. Hashmi's opinions admissible: (1) a review of the source code; or (2) a review and application of peer-reviewed research on facial-recognition algorithms. Dr. Hashmi's opinions are the product of neither. Dr. Hashmi admits that there is no basis in the source code for his opinions. And although he claims that his opinions are supported by scientifically valid facial-recognition research, the few publications he cites do not in fact support his opinions. His opinions thus amount to nothing more than *ipse dixit*, which is "the antithesis of . . . scientifically reliable expert opinion" and must be excluded under Rule 702. Fed. R. Evid. 702 advisory committee's note to 1972 amendment.

A.   Dr. Hashmi Admits That The Challenged Opinions Are Not Based On A Review Of Facebook's Source Code.

After having spent weeks reviewing Facebook's source code, Dr. Hashmi admits that *nothing* in the code supports either of the opinions at issue in this motion.

1.   Dr. Hashmi's First Opinion Is Not Based On The Source Code.

Dr. Hashmi's first opinion contains two parts: ██████████████████████

██

██

██████████████████████████   Dr. Hashmi admits that neither part is supported by the source code.

"Virtually every face." ████████████████████████████████

██

██

██

██

███

Identification of non-users. ████████████████████████████████

██

██

██

██

██

2.   Dr. Hashmi's Opinion That Facebook's Algorithms Extract "Facial Landmarks Or Features" Is Not Based On The Source Code.

Nor does the source code provide any support for Dr. Hashmi's second opinion: ████

██

██

██

1

2

3

B.   Dr. Hashmi's Opinions Are Not The Product Of Peer-Reviewed Research.

Because Dr. Hashmi's opinions were not the product of his review of Facebook's source code, they are admissible only if they are supported by research that has "been subjected to normal scientific scrutiny." *Domingo*, 289 F.3d at 605-06; *see also Daubert v. Merrell Dow Pharms, Inc.*, 43 F.3d 1311, 1317-18 (9th Cir. 1995) (Rule 702 requires "objective, verifiable evidence that the testimony is based on 'scientifically valid principles'"); *Lopez*, 139 F.3d 905, at *1 (expert testimony must reflect "scientific knowledge"). They are not.

1.   Dr. Hashmi's First Opinion Is Not Based On Any Research.

There is no scientific research supporting Dr. Hashmi's opinion that

"Virtually every face." Dr. Hashmi's report offers no explanation or citation for his opinion that Facebook's algorithms generate face signatures for "virtually every face" in a photo.

Indeed, the only relevant statement in Dr. Hashmi's report *contradicts* his opinion.

At his deposition, Dr. Hashmi manufactured a previously undisclosed basis for his conclusion:

FACEBOOK'S MOTION TO EXCLUDE PORTIONS OF THE EXPERT REPORT, OPINIONS, AND TESTIMONY OF DR. ATIF HASHMI;
CASE NO. 3:15-CV-03747-JD & CASE NO. 3:16-CV-00937-JD

1 ███

2 ███   But the faces in that database

3 were *already detected.*   *See* Labeled Faces in the Wild Home, at http://vis-

4 www.cs.umass.edu/lfw/ ("[T]he[] faces [in the database] were detected . . . .".) Accordingly, the

5 *DeepFace* paper provides no support for Dr. Hashmi's assumption that █████████████

6 ██. Dr.

7 Hashmi's reliance on this source is accordingly insufficient to render his opinion admissible.

8   ***Identification of non-users.***   A search of Dr. Hashmi's report reveals *no* explanation of

9 how he concluded that face signatures can be used to identify non-users of Facebook. Absent

10 any such explanation, there is simply no basis for determining that his method was reliable as

11 required by Rule 702. *See Claar*, 29 F.3d at 502; *Watts v. Allstate Indem. Co.*, 2013 WL 210059,

12 at *11-13 (E.D. Cal. Jan. 17, 2013).

          2.   **Dr. Hashmi's Opinion That Facebook's Algorithms Extract "Facial Landmarks Or Features" Is Not Based On Peer-Reviewed Research.**

15 Dr. Hashmi's second opinion—█████████████████████████████████████

16 ███

17 ████████████████████████████—fares no better. ███████████████

18 ███

19 ███

20 ███

21 ███████████████████████████████████

22 ***Facebook's DNN.*** ███

23 ███

24 ███

25 ███

26 ███████████████████████████████████

27 That belief is demonstrably lacking in scientific validity. ████████████████

28 ███

FACEBOOK'S MOTION TO EXCLUDE PORTIONS OF THE EXPERT REPORT, OPINIONS, AND
TESTIMONY OF DR. ATIF HASHMI;
CASE NO. 3:15-CV-03747-JD & CASE NO. 3:16-CV-00937-JD

1   ██   Nor can he. It is widely

2   recognized that DNNs are generally black boxes: Scientists have not been able to provide

3   generalizable explanations about how and why they work. *See* p.3 *supra*. ████████████

4   ██

5   ██

6   ██

7   ██

8   ██

9   The sole piece of scientific research cited by Dr. Hashmi in support of this opinion is a

10   2009 paper authored by researchers at Stanford University that describes and depicts a specific

11   type of deep network designed by the authors. ███████████████████████████████████

12   ██

13   ██

14   ████████████████████████   For three reasons, the Stanford paper does not support Dr. Hashmi's

15   conclusion. First, the figure in the paper *does not show* that the network extracts human-notable

16   facial features; instead, it shows that two of the network's layers extract and represent general

17   "features" (as opposed to human-notable facial features, *see* p.3 *supra*) from *all parts* of faces.

18   ██

19   ██   Second, the Stanford paper

20   only purports to visualize the features learned by the network designed by the paper's authors,

21   not of any other network. ███

22   ██

23   ██

24   ██

25   ██

26   ██

27   ████████████████████████████████████

28

FACEBOOK'S MOTION TO EXCLUDE PORTIONS OF THE EXPERT REPORT, OPINIONS, AND
TESTIMONY OF DR. ATIF HASHMI;
CASE NO. 3:15-CV-03747-JD & CASE NO. 3:16-CV-00937-JD

1   Thus, there is no scientific research supporting the theory on which Dr. Hashmi's opinion

2 is based. Rule 702 requires the exclusion of that opinion.

3   ***Facebook's pre-2014 algorithm.*** ████████████████████████████

4 ██

5 ██

6 ████████████████████████ This opinion should be excluded as well.

7 **II.   DR. HASHMI IS NOT QUALIFIED TO GIVE THE CHALLENGED OPINIONS.**

8   Dr. Hashmi's inability to find support for his opinions in the source code gives rise to

9 another basis for excluding them.   Under Rule 702, a witness may provide opinion testimony

10 only if he has "'knowledge, skill, experience, training or education' *relevant to such evidence or*

11 *fact in issue*." *United States v. Chang*, 207 F.3d 1169, 1172 (9th Cir. 2000) (emphasis added).

12 "It is not enough that the proposed expert have expertise in an area of knowledge. The expertise

13 must be relevant to the determination of the facts in issue." *In re Canvas Specialty, Inc.*, 261

14 B.R. 12, 19 (Bankr. C.D. Cal. 2001); *see, e.g.*, *Chang*, 207 F.3d at 1172-73 & n.2 (witness who

15 was "extremely qualified" in international finance was not qualified to opine on the authenticity

16 of a securities certificate where he lacked training in identification of counterfeit securities).

17   Because Dr. Hashmi does not rely on Facebook's source code to reach his opinions, any

18 expertise he may have in analyzing source code is simply irrelevant. And even if Dr. Hashmi's

19 opinions had a scientifically valid basis in research on how facial-recognition algorithms work as

20 a general matter (*but see* pp. 9-11 *supra*), Dr. Hashmi is not qualified to testify on those subjects.

21   **A.   Dr. Hashmi Is Not Qualified To Opine About How Facial-Recognition
              Algorithms Generally Work.**

22

23 ██

24 ██

25 ██

26 ██

27 ████████████████████████ He therefore has no qualification to opine on the capabilities of

28 Facebook's facial-recognition system or on what type of information Facebook's facial-

12

1   recognition system—or, for than matter, *any* facial-recognition system—extracts, learns, or relies

2   on to generate face signatures.

3   Dr. Hashmi's lack of expertise is confirmed by his ignorance and misunderstanding of

4   basic facial-recognition concepts that underpin his opinions.

5

6

7   At his deposition, Dr. Hashmi revealed an utter lack of knowledge

8   about face detection algorithms. The "seminal," "most influential work" on face detection is the

9   Viola-Jones detection approach. Bin Yang et al., *Aggregate Channel Features for Multi-view*

10   *Face Detection* 1 (Ex. 10); Cha Zhang & Zhengyou Zhang, *A Survey of Recent Advances in Face*

11   *Detection, Technical Report MSR-TR-2010-66* at 1, Microsoft Research (2010) (Ex. 11).

12

13

14

15

16

17   On this

18   subject, too, he is woefully uninformed. A well-known and standard type of feature that is used

19   by facial- and other object-recognition algorithms is a "texture measure." *See, e.g.*, Mark Nixon

20   & Alberto Aguado, FEATURE EXTRACTION & IMAGE PROCESSING ch. 8 (2d ed. 2008) (Ex. 12)

21   (devoting chapter to texture description, segmentation and classification); B.S. Manjunath &

22   W.Y. Ma, *Texture Features for Browsing and Retrieval of Image Data*, IEEE Transactions on

23   Pattern Analysis and Machine Intelligence 18: 837 (1996) (Ex. 13) ("Texture analysis has a long

24   history . . . .").

25

26

27

28

13

1

2

3

4   ██████████████████████████████████████ He is not, and that lack of expertise in holistic

5   and any other facial-recognition algorithms, renders him unqualified to present his first two

6   opinions at trial.

7   **B.   Dr. Hashmi Cannot Compensate For His Lack Of Expertise In
           Facial-Recognition Algorithms With Expertise In Deep Neural Networks.**

8

9

10

11

12   ████████████   But that limited experience falls far short of establishing his expertise in *all*

13 DNNs.   And   it   certainly   does   not   establish   his   expertise   to   opine   on   Facebook's

14 facial-recognition system—███.

15   Dr. Hashmi is not an expert on DNNs generally. ████████████████████████

16

17

18

19

20

21

22 These limited experiences are far from the "extensive hands-on experience over a meaningful

23 period of time during which a person develops a working expertise in a certain area." *Jones v.*

24 *Lincoln Elec. Co.*, 188 F.3d 709, 724 (7th Cir. 1999).

25   But even if Dr. Hashmi had expertise in DNNs generally, that expertise would not be

26 relevant to the two opinions challenged in this motion. ████████████████████

27

28

14

1 ███

2   Nor would such experience allow Dr. Hashmi to opine on the features extracted, learned,

3 or relied on by Facebook's facial-recognition DNN.   ████████████████████████████

4 ██

5 ██

6 ██

7 ██

8 ██

9 ████████████████████████████   It is irrelevant that he might have

10 experience with *other* technologies that use DNNs to accomplish tasks like audio and motion

11 pattern classification. *See, e.g., Avila v. Willits Env'l Remediation Tr.*, 633 F.3d 828, 839 (9th

12 Cir. 2011); *Colby v. Newman*, 2012 WL 12885118, at *5 (C.D. Cal. Nov. 20, 2012).

13   In short, Dr. Hashmi is not qualified to opine on (1) whether Facebook's facial-

14 recognition algorithms generate face signatures for "virtually every face" that appears in a photo

15 uploaded to Facebook, and whether those face signatures can be used to identify non-users; and

16 (2) whether Facebook's facial-recognition algorithms extract, learn, or rely on "facial landmarks

17 and features" to generate face signatures. These opinions should be excluded.

18   **CONCLUSION**

19   For the foregoing reasons, Facebook respectfully requests that this Court exclude the

20 portions of Dr. Hashmi's report, opinions, and proposed testimony on (1) the ability of

21 Facebook's algorithms to generate face signatures for and use those face signatures to identify

22 virtually every face that appears in a photo, including faces of non-users; and (2) the information

23 that is extracted, learned, and relied on by Facebook's algorithms to generate face signatures.

24 Dated: March 16, 2018   MAYER BROWN LLP

25   By: */s/ John Nadolenco*

26   John Nadolenco
                                               Lauren R. Goldman

27   *Counsel for Defendant Facebook, Inc.*

28